

We claim:

1           1.     An automated data storage system for storing and accessing a plurality of data  
2 storage media stored in a plurality of storage slots, said automated data storage system having at  
3 least one data storage drive for receiving said data storage media and reading and/or writing data  
4 thereon, comprising:

5           a first media storage library having a first rail system disposed therein;

6           a garage disposed adjacent said first media storage library, said garage having a movable  
7 rail system disposed therein;

8           one or a plurality of accessors for accessing and transporting said data storage media  
9 between said storage slots and said data storage drive, wherein said one or a plurality of  
10 accessors is moveably disposed on said first rail system or on said movable rail system;

11           wherein said movable rail system can be positioned such that said one or a plurality of  
12 accessors can move between said first rail system and said movable rail system.

1           2.     The automated data storage system of claim 1, wherein said first rail system  
2 further comprises a proximal end and a distal end, and wherein said movable rail system further  
3 comprises a first end and a second end, and wherein said first end can be positioned to be  
4 substantially colinear with said proximal end such that said one or plurality of accessors can  
5 move between said first rail system and said movable rail system.

1           3.     The automated data storage system of claim 2, wherein said movable rail system  
2 further comprises a first positioning apparatus disposed on said first end and a second positioning  
3 apparatus disposed on said second end.

1           4.     The automated data storage system of claim 1, wherein said movable rail system  
2 comprises two parallel rails.

1           5.       The automated data storage system of claim 1, wherein said movable rail system  
2 comprises a plurality of paired parallel rails, wherein each of said plurality of paired parallel rails  
3 has a first end and a second end.

1           6.       The automated data storage system of claim 5, wherein each of said pairs of  
2 parallel rails further comprises a first positioning apparatus disposed on its first end and a second  
3 positioning apparatus disposed on its second end.

1           7.       The automated data storage system of claim 1, wherein said garage further  
2 comprises one or a plurality of doors.

1           8.       The automated data storage system of claim 1, wherein said first rail system  
2 comprises two parallel rails.

1           9.       The automated data storage system of claim 1, further comprising one or a  
2 plurality of movable media storage devices.

1           10.      An automated data storage system for storing and accessing a plurality of data  
2 storage media stored in a plurality of storage slots, said automated data storage system having at  
3 least one data storage drive for receiving said data storage media and reading and/or writing data  
4 thereon, comprising:

5           a first media storage library having a first rail system disposed therein;

6           a second media storage library having a second rail system disposed therein;

7           a garage having a movable rail system disposed therein, wherein said garage is disposed  
8 adjacent said first media storage library and adjacent said second media storage library;

9           one or a plurality of accessors for accessing and transporting said data storage media  
10 between said storage slots and said data storage drive, wherein said plurality of accessors is

11 moveably disposed on said first rail system, or on said second rail system, or on said movable  
12 rail system;  
13 wherein said movable rail system can be positioned such that said one or a plurality of  
14 accessors can move between said first rail system and said movable rail system, and wherein said  
15 movable rail system can be positioned such that said one or a plurality of accessors can move  
16 between said second rail system and said movable rail system.

1 11. The automated data storage system of claim 10, wherein said movable rail system  
2 can be positioned such that said one or a plurality of accessors can move between said first rail  
3 system and said movable rail system and between said second rail system and said movable rail  
4 system.

5 12. The automated data storage system of claim 10, wherein said movable rail system  
6 further comprises a first positioning apparatus disposed on said first end and a second positioning  
7 apparatus disposed on said second end.

8 13. The automated data storage system of claim 10, wherein said movable rail system  
9 comprises two parallel rails.

10 14. The automated data storage system of claim 10, wherein said movable rail system  
11 comprises a plurality of paired parallel rails, wherein each of said plurality of paired parallel rails  
12 has a first end and a second end.

13 15. The automated data storage system of claim 14, wherein each of said pairs of  
14 parallel rails further comprises a first positioning apparatus disposed on its first end and a second  
15 positioning apparatus disposed on its second end.

16 16. The automated data storage system of claim 10, wherein said garage further  
17 comprises one or a plurality of doors.

1           17.     The automated data storage system of claim 10, wherein said first rail system and  
2     said second rail system each comprise two parallel rails.

1           18.     The automated data storage system of claim 10, further comprising one or a  
2     plurality of movable media storage devices.

1           19.     A method of moving one or a plurality of accessors within an automated data  
2     storage system for storing and accessing a plurality of data storage media stored in a plurality of  
3     storage slots, said automated data storage system comprising said one or a plurality of accessors  
4     and at least one data storage drive for receiving said data storage media and reading and/or  
5     writing data thereon, wherein said one or a plurality of accessors access and transport said data  
6     storage media between said storage slots and said data storage drive, said method comprising the  
7     steps of:

8                 providing a first media storage library having a first rail system disposed therein;

9                 providing a second media storage library having a second rail system disposed therein;

10                providing a garage having a movable rail system disposed therein, wherein said garage is  
11     disposed adjacent said first media storage library and adjacent said second media storage library;

12                movably disposing said one or a plurality of accessors on said first rail system;

13                positioning said movable rail system to be substantially colinear with said first rail  
14     system;

15                moving said one or a plurality of accessors from said first rail system onto said movable  
16     rail system;

17                positioning said movable rail system to be substantially colinear with said second rail  
18     system; and

19 moving said one or a plurality of accessors from said second rail system onto said  
20 movable rail system.

1 20. The method of claim 19, further comprising the steps of:  
2 positioning said movable rail system to be substantially colinear with both said first rail  
3 system and said second rail system; and  
4 moving said one or a plurality of accessors from said first rail system onto said movable  
5 rail system and then from said movable rail system onto said second rail system.

1 21. The method of claim 20, wherein said movable rail system has a first end and a  
2 second end, and wherein said movable rail system further comprises a first positioning device  
3 disposed on said first end and a second positioning device on said second end.

1 22. The method of claim 20, wherein said movable rail system comprises a plurality  
2 of paired parallel rails, wherein each of said plurality of paired parallel rails has a first end and a  
3 second end; and wherein each of said pairs of parallel rails further comprises a first positioning  
4 apparatus disposed on the first end and a second positioning apparatus disposed on the second  
5 end.

1 23. A method to balance work load in an automated data storage system for storing  
2 and accessing a plurality of portable data storage cartridges stored in a plurality of storage slots,  
3 said automated data storage system comprising a plurality of accessors and a plurality of data  
4 storage drives, said drives used for receiving said data storage media and reading and/or writing  
5 data thereon, wherein said plurality of accessors access and transport said portable data storage  
6 cartridges between said storage slots and said data storage drives, said method comprising the  
7 steps of:

8 providing a first media storage library comprising a first rail system, a plurality of first  
9 storage slots, and a first data storage drive;  
10 providing a second media storage library comprising a second rail system, a plurality of  
11 second storage slots, and a second data storage drive;  
12 providing a garage having a plurality of movable rail systems disposed therein, wherein  
13 said garage is disposed adjacent said first media storage library and adjacent said second media  
14 storage library;  
15 providing a movable media storage device movably disposed on one of said plurality of  
16 movable rail systems;  
17 positioning said movable media storage device adjacent said first media library;  
18 transferring one or a plurality of portable data storage cartridges from said first plurality  
19 of storage slots to said movable media storage device; and  
20 positioning said movable media storage device adjacent said second media storage  
21 library.

22  
23 24. The method of claim 23, wherein said plurality of movable rail systems comprises  
24 a plurality of paired parallel rails, wherein each of said plurality of paired parallel rails has a first  
25 end and a second end; and wherein each of said pairs of parallel rails further comprises a first  
26 positioning apparatus disposed on said first end and a second positioning apparatus disposed on  
27 said second end.